

Chemistry AE
Physical/Chemical Changes Lab

All changes that matter undergoes can be classified into two categories. Physical changes are changes through which a substance does not change identity. Chemical changes are changes through which a substance transforms into another substance. There are several indications that a chemical change has taken place. Any time a new substance is formed a chemical change has taken place. This new substance can be a gas (bubbling or fizzing), ash, smoke, etc.

This experiment is broken down into several short experiments. During each part you will write down observations and determine if the change is physical or chemical. Record this information in the data table.

1. **Burning a candle.** Light the candle and use the wax from the candle to attach it to the glass plate. Observe the candle as it burns.
2. **Melting wax.** Melt the wax in the test tube by holding it over the candle, using the test tube holder. Observe the wax as it melts. After it has all melted, place it in a test tube rack to cool, then clean the outside and return the test tube.
3. **Tearing paper.** Tear a small square of paper into little pieces and place them on a watch glass. Observe the paper as it is torn.
4. **Burning paper.** Hold a lit match to the torn paper and watch as it burns. BE CAREFUL NOT TO BLOW ON THE PAPER. Do NOT keep relighting the paper. Observe any changes in the paper.
5. **Dissolving salt.** Place a small amount of salt to a test tube. Add about 2-3 cm of water. Use a stirring rod to dissolve the salt. Observe changes.
6. **Adding saltwater and silver nitrate.** Add a couple of drops of silver nitrate (AgNO_3) to the salt water. BE VERY CAREFUL, SILVER NITRATE WILL STAIN SKIN AND CLOTHES. Observe changes.
7. **Adding hydrochloric acid to zinc.** Place a few pieces of zinc in a test tube. Add about 1-2 cm of HCl (hydrochloric acid). BE VERY CAREFUL, HCl CAN CAUSE SKIN IRRITATION. If you get it on your skin immediately wash your hands and inform the instructor. Observe any changes in the test tube. Feel the test tube over the next several minutes and determine if there is a change in temperature.
8. *Demonstration:* **Burning magnesium.** Observe as the instructor lights a piece of magnesium ribbon. Note any differences in the magnesium ribbon.

Names _____

Date _____

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Data Table.

If the change is physical, explain how the substance did not change identity despite a change in appearance.

If the change is chemical, explain how the substance's identity changed. List ALL "new" substances that were formed. (ex: ash, smoke, gas, etc.)

| | Physical/Chemical | Indication |
|---|-------------------|------------|
| Burning a candle | | |
| Melting wax | | |
| Tearing paper | | |
| Burning paper | | |
| Dissolving salt | | |
| Adding saltwater to AgNO_3 | | |
| Adding HCl to zinc | | |
| Burning magnesium | | |

Questions. Please answer in COMPLETE sentences.

1. What are four indications that a chemical reaction has taken place? (remember to use complete sentences!)

2. The following changes do not always indicate chemical changes. Give examples in which they might indicate physical changes.

a. change in color

b. apparent loss of mass

c. apparent disappearance of a substance

3. How can substances in a mixture be separated? How can substances in a compound be separated? Give examples from this experiment.
